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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/856,495	09/24/2001	Jorg Adler	P21094	2775

7055 7590 01/04/2005

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EXAMINER

MENON, KRISHNAN S

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/856,495

Applicant(s)

ADLER ET AL.

Examiner

Krishnan S Menon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-45 is/are pending in the application.
- 4a) Of the above claim(s) 29-41, 44 and 45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-28, 42 and 43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims 19-45 are pending, of which claims 29-41,44 and 45 are withdrawn from consideration as being directed to a non-elected invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 19-23, 25 – 28, 42 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over WO 96/30207 A1.

Since WO 96/30207 is in German, the equivalent US patent to Ravagni et al (US 6,576,182) is used for the rejection.

Claim 19: WO/30207 teaches a ceramic multi-layer filter comprising at least two layers (see examples) having same or different materials (col 3 lines 6-64) and different particle sizes (examples), one of it being a support layer (examples), materials of similar thermal coefficient of expansion (see pages 1,2; col 3 and claim 1).

Re the limitation that the ceramic particles are bonded by spot or surface connections by the wetting material: Ravagni teaches that using low-temperature-sintering glass (wetting agent used by the applicant in working examples) for adjusting

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shrinkage as “widely used” in col 1 lines 23-45, but not good for many applications.

This teaching of Ravagni anticipates the said limitation. A reference is no less anticipatory if, after disclosing the invention, the reference then disparages it. The question whether a reference “teaches away” from the invention is inapplicable to an anticipation analysis. *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998)

The rest of the limitations in claim 19, such as particles wet by wetting material, pore volume and pore size reduced by the material only partially and no more than 50% (powder to binder ratio being set at 5:1 would have this less than 50% in Ravagni - examples), the recitation of the characteristics of the ingredients and their change in properties during “forming”, “with about <1% shrinkage of the ceramic multiplayer filter”, etc., correspond to what happens during formation, i.e., when sintered during manufacture, and is not a property of the multiplayer filter product that varies during the normal use of the product, and do not constitute structural limitations on the product. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re *Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). The same is true for claims 42 and 43, and any structural alteration in the particles during formation (sintering) does not reflect as a property of the finished product.

Claim 20: multi layer in which the particle size decrease in direction going away from the support – see col 2 summary of invention.

Claims 21, 22, 23: the ceramic material could be the same in all layers, silicon carbide or alumina, and same surface wetting material – see col 3 lines 6-35 and examples.

Claims 25 and 26: pore volume and pore size reduced only slightly by the material, and not more than 10%: The ref does not specifically say that, but this would be inherent because the ref has same or similar materials for the ceramic multiplayer filter. It is also a process limitation.

Claim 27: particle size ratio between 1:5 and 1:10: particle sizes from 1 nm to 500 nm and agglomerates from 10 to 500 microns are described for use in various layers (col 2).

Claim 28: the support layer average particle size would fall within the range of particle size given by WO'207.

2. Claims 19 – 27, 42 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, under 35 USC 103(a) as unpatentable over Abe et al, (US 4,971,696).

Claim 19 recites a ceramic multi-layer filter comprising at least two layers of same or different materials and of different particle sizes in the two layers, one layer being a support layer and the other layer having smaller particle size, the ceramic

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particles in the membrane being surface or spot-bonded by a surface-wetting material.

The rest of the claim recites process of forming the filter.

Abe teaches a ceramic filter having multiple layers (col 3 lines 45-55), layers having different particle sizes (col 4 lines 31-65), with the pore size successively reducing with the layers (col 4 lines 45-55). The filter is formed by sintering ceramic particles and borosilicate glass (wetting agent; col 4 lines 42-55). The reference does not explicitly state that it is a wetting agent and it forms the spot or surface contacts, but this would be inherent. The express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. "The inherent teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness." *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) (affirmed a 35 U.S.C. 103 rejection based in part on inherent disclosure in one of the references). See also *In re Grasselli*, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983). The filter layers also is described as desired to have the same coefficient of thermal expansion (col 5 lines 30-35). Particle sizes, etc are taught in col 5 lines 14-68.

Regarding the process limitations in claim 19, 42 and 43, see *In re Thorpe* above.

Claim 20: multi layer in which the particle size decrease in direction going away from the support – see col 4 lines 45-55.

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Claims 21, 22, 23: the ceramic material could be the same in all layers, silicon carbide or alumina, and same surface wetting material – see col 4 lines 44-50 and examples.

Claim 24: borosilicate glass – col 4 line 47.

Claims 25 and 26: pore volume and pore size reduced only slightly by the material, and not more than 10%: a process limitation; In re Thorpe.

Claim 27: particle size ratio between 1:5 and 1:10: particle sizes are described in col 3 lines 27-44, col 6 lines 40-63, col 9 lines 60-67, which meet this ratio.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO/30207

A1 in view of Partlow et al (US 5,683,528).

WO (or Ravagni'182) teaches all the limitations of claim 19. Claim 24 adds further limitation of the type of glass used, which WO has not specified. Partlow teaches borosilicate glass in the ceramic layers (col 2 lines 10-30). It would be obvious to one of ordinary skill in the art at the time of invention to have the teaching of Partlow in the teaching of WO'207 for applications where sintered-glass ceramic filters are

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useful, because WO'207 does not specify the glass; Partlow teaches a glass with extremely low thermal expansion coefficient (col 1 lines 65-66) and which equals the thermal expansion coefficient of the ceramic particles (col 2 lines 10-20).

4. Claim 28 is rejected under 35 USC 103(a) as unpatentable over Abe et al, (US 4,971,696).

Claim 28: Abe does not teach the average particle sizes of the support layers, but teaches the support layers in terms of the average pore sizes (see col 5). However, it would be obvious to one of ordinary skill in the art at the time of invention that the support layer average particle size could be determined to suit the pore size of the support layer.

Response to Arguments

Applicant's arguments filed 12/8/04 have been fully considered but they are not persuasive.

In response to the argument that Ravagni documents show considerable changes in the particle size, morphology, composition and/or crystal structure: This may be true, but these changes take place during manufacture. What is claimed is a product, and the changes occurring during manufacture would not affect patentability as long as the product, or in this case the teachings in the reference, structurally anticipates the claimed invention.

In response to the argument that the bond between the ceramic particles is substantially formed through the liquid-phase wetting material, and that Ravagni seeks to avoid the use of glass: this is anticipated by the reference because it teaches that glass binders are inferior for certain applications. 'Teaching away' is anticipatory: *Celeritas Technologies Ltd. v. Rockwell International Corp.* It may be noted that the Ravagni reference teaches the glass binder as being "widely used". Several other references (listed under 'Conclusion' below) also teach the same.

In response to the argument that Ravagni is contrasting his invention from the prior art (page 14 of the arguments): Does this mean that the applicants are admitting that use of glass as binder in ceramic filters is known?

In response to applicants' chart showing the difference in the inventions of Ravagni and that of the applicants: the differences pointed out are in the process. In the Ravagni product, it is agreed that there is no low-melting glass phase binder. However, as described in the above paragraphs, Ravagni's teaching away from the glass binder for certain applications anticipates the claims.

In response to the arguments against inherency: Applicants have recited a lengthy list of case laws against inherency without pointing out what in the inherency rejection requires evidence of inherency. The inherency rejection is used in this office action for glass as being a 'wetting agent', because the reference does not explicitly state 'wetting agent'. If it is a wetting agent for the applicant, in the similar conditions and with same materials, it would be a wetting agent for anyone else too, including the reference.

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In response to the arguments against the Partlow ref: as was pointed out in the previous office actions, Partlow ref was used for its teaching of borosilicate glass, especially, its low coefficient of thermal expansion, and because the primary ref does not specifically teach a glass material. The reference was not used for its teaching of how the packaging is made or the structure of the packaging, but only to the use of borosilicate glass as binder with ceramic powder. Applicants' arguments that this reference teaches a dense product of the glass with only a small amount of ceramic powder is not relevant in as much as the glass material binds the ceramic whether it covers the ceramic particles completely or only forms spots. It may be of interest to note that applicants' claim 19 recites the ceramic particles as "wet entirely or partially" with the wetting agent (glass). Regarding the argument about multi-layer, see fig 4 and col 4 lines 47-64, which teaches multi-layer structure.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

(1) Smith et al (US 5,780,126) teaches that silicon carbide filters with glassy binder are 'conventional', commercially available and are known to be susceptible to thermal shock (col 2 lines 7-29). Problems associated with low-melting glasses as binder in ceramic phases is also described in col 4 lines 19-34.

(2) Tsukada (US 4,777,152) teaches porous silicon carbide bodies with glass binder as having poor strength and of limited applicability. See columns 1 and 2.

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(3) Nakamura et al (US 5,322,537) teaches problems associated with mixing ceramic and glassy phases, means to overcome such problems and make filters with low thermal expansion.


This is a first action after an RCE, and is made non-final because of the additional grounds for rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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